WHAT IS CLAIMED IS:

1. A method for separation and collection of at least one component from a mixture of components comprising the steps of:

a. providing an apparatus comprising a separation chamber and a plurality of purge chambers, and establishing a first buffer flow in the separation chamber in the axial direction, said first buffer flow having a first flow rate;

b. establishing a second buffer flow in the separation chamber consisting of two flows on either side of the first flow that converge on the first flow at the chamber entrance and diverge from the first flow at the chamber exit;

c. establishing a third buffer flow in each of at least two purge chambers in the axial direction, said second buffer flow having a second flow rate, said second buffer fluid flow having a second flow rate higher than that of the first flow rate;

d. introducing two precision-pore screens that partition the said separation chamber from each of the two said purge chambers;

e. establishing a fourth buffer flow by the biasing of the purge valves to control said fourth buffer flow from one of the purge chambers through a precision-pore screen transversely into the separation chamber, then out of the separation chamber through the second precision-pore screen into a second purge chamber, thus providing the required uniform focusing fluid velocity in the separation chamber;

f. introducing the mixture of sample components with the said first buffer flow directly into the separation chamber flow entrance or through at least one injection port located in the separation chamber interior;

g. controlling the second buffer flow to converge and thin the first buffer flow with sample components at the separation chamber entrance and then diverge and extract sample components at the separation chamber exit; and

h. applying an electrical potential transversely across the separation chamber in the form of a constant voltage gradient to impart electrophoretic velocity to the fractional components in the separation chamber in the transverse direction perpendicular to the first buffer flow direction and parallel to the fourth buffer flow direction.

2. A method according to claim 1 wherein the separated sample is withdrawn through a single collection port or from each of a plurality of collection ports.

3. A method according to claim 1 wherein the sample is injected with the said first flow at the flow entrance of the separation chamber and thinned by said second buffer converging co-flow.

4. A method according to claim 1 wherein one sample component is maintained in the separation chamber while extraneous components are discarded with the said third flow through the purge chambers and diverging said second flow at the exit of the separation chamber.

5. A method according to claim 1 wherein the said fourth buffer flow is adjusted by manipulation of said purge valves to provide a transversely varying cross-flow velocity which allows any selected sample component to be either analyzed or collected at a single collection port.

6. A method according to claim 5 wherein the sample is acted on by the combined influences of a constant electric field and said fourth buffer flow transversely across the separation chamber.

7. A method according to claim 5 wherein the selected sample component is collected at the flow exit of the separation chamber.

8. A method according to claim 1 wherein one sample fraction is maintained in the separation chamber and arrives at a single collection port in the separation chamber while extraneous components are either discarded through the said purge chambers or flow around the collection port and out of the separation chamber at the carrier buffer flow exit.

9. A method according to claim 8 wherein the sample fractions may be scanned in the exit region of the separation chamber by a detector system with sample fractions being collected in a single or multiple set of collection ports.

10. A method according to claim 8 wherein the fraction spectrum of a sample may be analyzed or collected by varying the flow of a pump in a linear variation to present a time-dependent histogram.

11. A method according to claim 1 wherein the sample fraction spectrum in the separation chamber completely fills the transverse chamber thickness with the remainder of the spectrum being diverted through said precision-pore screens into and out of the purge chambers.

12. A method according to claim 11 wherein the sample fraction spectrum being viewed may be changed by varying the control of said purge valves.

13. A method according to claim 11 wherein the sample fraction spectrum being viewed may be collected in singular or multiple collection ports by varying the purge valve settings for the fourth flow rate of focusing fluid velocity

14. A method according to claim 4 wherein the sample entering collection ports may be recycled back to the corresponding sample entry ports to be reclaimed and reinjected back into the separation chamber to minimize any loss of valuable sample constituents.